

GUJARAT TECHNOLOGICAL UNIVERSITY
BE – SEMESTER III– • EXAMINATION – SUMMER 2015

Subject Code:130702**Date:09/06/2015****Subject Name: Data and File structure****Time: 02.30pm-05.00pm****Total Marks: 70****Instructions:**

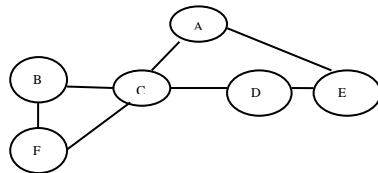
1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

- Q.1 (a)** **07**
- (i) Write algorithm to sum values in vector V and find out the execution time required. **04**
- (ii) Explain the equation that finds out the address of the element of the one dimensional array. Assume necessary data. **03**
- (b)** **07**
- (i) Convert the following Polish(prefix) expression to Reverse Polish(suffix) notation **04**
- a. ++abc
- b. +a+bc
- c. +a*bc
- d. *a+bc
- (ii) Does a time sharing computer use a queue or stack? Explain. **03**
- Q.2 (a)** Write an algorithm for inserting a node and deleting a node in doubly linked linear list. **07**
- (b)** Write steps of procedure to insert an element to the top of the stack and remove top element from a stack. **07**
- OR**
- (b)** What is the advantage of Polish expression over infix notation? Write an algorithm to convert an infix expression into reverse Polish expression. **07**
- Q.3 (a)** **07**
- (i) Write a recursive algorithm to find factorial. **04**
- (ii) Which type of allocation is called linked allocation? Define singly linked linear list. **03**
- (b)** **07**
- (i) Explain the threaded storage representation for binary trees. **04**
- (ii) Define the inorder, postorder and preorder traversal for the following tree. **03**
- ```

graph TD
 A((A)) --- B((B))
 A --- D((D))
 B --- C((C))
 D --- E((E))
 D --- G((G))
 E --- F((F))

```
- OR**
- Q.3 (a)** **07**
- (i) What are the advantages of circular lists over singly linked list? **04**
- (ii) Explain – Why doubly linked lists are much more efficient with respect to deletions than singly linked lists? **03**

- (b) (i) Define adjacency matrix. When two digraphs are considered to be equivalent? **07**  
**04**  
(ii) Explain the breadth first search and depth first search tree traversal on the following graph. **03**



- Q.4** (a) Write an algorithm for inserting and deleting an element from queue. **07**  
**07**  
(b) (i) Define 2-3 tree. Describe the characteristic of 2-3 tree. **04**  
(ii) Write the characteristics of AVL tree. **03**

**OR**

- Q.4** (a) What is a circular queue? Write an algorithm for inserting and deleting an element from a circular queue. **07**  
**07**  
(b) (i) Explain the structure of sequential file. **04**  
(ii) Explain the structure of indexed sequential files. **03**

- Q.5** (a) What is collision? Explain two broad classes of collision resolution techniques. **07**  
**07**  
(b) Explain the binary search method. Write an algorithm for performing a binary search. **07**

**OR**

- Q.5** (a) What is hashing? Explain hashing functions. **07**  
**07**  
(b) Explain the multi key file organization and access methods. **07**

\*\*\*\*\*